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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Yu et al.

Attorney Docket No.:

NOVLP078/NVLS-2856

Patent: 6,967,405 B1

Issued: November 22, 2005

Title: NOVEL FILM FOR COPPER DIFFUSION  
BARRIER

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on January 19, 2006 in an envelope addressed to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450.

Signed:

Aurelia M. Sanchez

**REQUEST FOR CERTIFICATE OF CORRECTION  
OF OFFICE MISTAKE  
(35 U.S.C. §254, 37 CFR §1.322)**

**Certificate**

**JAN 25 2006**

**of Correction**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
Attn: Certificate of Correction

Dear Sir:

Attached is Form PTO-1050 (Certificate of Correction) at least one copy of which is suitable for printing. The errors, together with the exact page and line number where the errors are shown correctly in the application filed, are as follows:

**TITLE PAGE:**

1. In the title, please add --Novel-- before "Film". This appears correctly in the patent application as filed on September 24, 2003, on page 1, line 1.

2. Please add the following Assignee information:

--(73) Assignee: Novellus Systems, Inc., San Jose, CA (US)--. This appears correctly in the Assignment Recordation Cover Sheet as recorded on September 24, 2003.

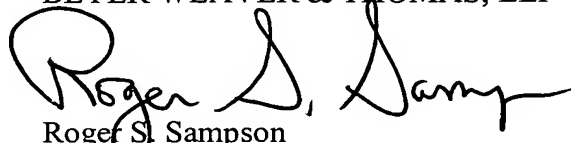
**JAN 26 2006**



Patentee hereby requests expedited issuance of the Certificate of Correction because the error lies with the Office and because the error is clearly disclosed in the records of the Office. As required for expedited issuance, enclosed is documentation that unequivocally supports the patentee's assertion without needing reference to the patent file wrapper.

It is noted that the above-identified errors were printing errors that apparently occurred during the printing process. Accordingly, it is believed that no fees are due in connection with the filing of this Request for Certificate of Correction. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. NOVLP078).

Respectfully submitted,  
BEYER WEAVER & THOMAS, LLP

  
Roger S. Sampson  
Registration No. 44,314

P.O. Box 70250  
Oakland, CA 94612-0250  
650-961-8300

JAN 26 2006

# NOVEL FILM FOR COPPER DIFFUSION BARRIER



## BACKGROUND

This invention relates to low dielectric constant layers for use in various applications. The invention also relates to methods of forming low dielectric constant layers in a wide range of VLSI fabrication operations.

As the features of microelectronic integrated circuits devices are reduced to smaller sizes, the electrical properties of the materials that constitute the devices will require change and improvement. One material that must be improved is the electrical insulator ("dielectric") used between the wires, metal lines, and other elements of the circuit. Without improvement in the insulator material, there will be increased problems due to capacitive effects such as coupling (crosstalk) and propagation delay. The speed at which future circuits will operate will be limited by RC delay in the interconnect.

These difficulties can be mitigated by preparing the circuit using an inter-layer dielectric ("ILD") having a dielectric constant that is as low as possible. For integrated circuits that are fabricated using a damascene or dual damascene method, the ILD is composed of an insulating material and a copper diffusion barrier film. Although it is important for both the insulating material and the copper diffusion barrier film to be formed of materials having a low dielectric constant, the present application is mainly directed to methods and devices for producing a copper diffusion barrier film having a low dielectric constant.

JAN 26 2006



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-PATENTS ONLY-

R SHEET

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09/24/03

Patentable Commissioner of Patents and Trademarks:

Please record the attached original document(s) or copy thereof.

1. Name of conveying party(ies) **9.24.03**
- a) Yongsik Yu
  - b) Karen Billington
  - c) Robert Hepburn
  - d) Michael Carris
  - e) William Crew
2. Name and address of receiving party(ies):
- a) Name: Novellus Systems, Inc.
  - Address: 3970 North First Street, San Jose, CA 95134

3. Nature of conveyance
- |                                     |                    |                          |                   |
|-------------------------------------|--------------------|--------------------------|-------------------|
| <input checked="" type="checkbox"/> | Assignment         | <input type="checkbox"/> | Merger            |
| <input type="checkbox"/>            | Security Agreement | <input type="checkbox"/> | Change of Name    |
| <input type="checkbox"/>            | Other _____        | <input type="checkbox"/> | License Agreement |

Execution Date:

- a) 9/18/03
  - b) 9/19/03
  - c) 9/19/03
  - d) 9/22/03
  - e) 9/23/03
4. Application Number(s) or Patent Number(s): NEW

The title of the (new) application is:

**10670660****NOVEL FILM FOR COPPER DIFFUSION BARRIER**

5. Please send all correspondence concerning this (these) documents to:

Beyer Weaver & Thomas, LLP  
P.O. Box 778  
Berkeley, CA 94704-0778  
Ph: (510) 843-6200  
Fax: (510) 843-6203  
(Customer Number: 022434)

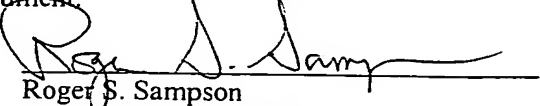
6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 3.41): \$40.00

- ☒ Enclosed
- ☒ Any additional fees are authorized to be charged to Deposit Account No. 500388 (Order No. NOVLP078)

8. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Date: September 24, 2003

  
Roger S. Sampson  
Registration No. 44,314

Attorney Docket No. NOVLP078/NVLS-2856

(Revised 12/01)

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(Also Form PT-1050)

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,967,405 B1

DATED : November 22, 2005

INVENTOR(S) : Yu et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

### In the Title Page:

In the title, please add --Novel-- before "Film".

Please add the following Assignee information:

--(73) Assignee: Novellus Systems, Inc., San Jose, CA (US)--.

MAILING ADDRESS OF SENDER:

Roger S. Sampson  
BEYER WEAVER & THOMAS, LLP  
P.O. Box 70250  
Oakland, CA 94612-0250

PATENT NO. 6,967,405 B1

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JAN 26 2006